

ABSTRACT OF THE DISCLOSURE

An electron emission element of the present invention comprises a substrate, and a protrusion protruding from the substrate and including boron-doped diamond. The protrusion comprises a columnar body. And a tip portion of the protrusion comprises an acicular body sticking out therefrom. The distance  $r$  [cm] between a center axis and a side face in the columnar body and the boron concentration  $Nb$  [ $\text{cm}^{-3}$ ] in the diamond satisfy the relationship represented by the following formula (1):

$$r > \frac{10^4}{\sqrt{Nb}} \quad (1).$$